BRITISH WARBLERS.

The British Warblers: a History, with Problems of their Lives. By H. Eliot Howard. Illustrated by H. Grönvold. Two volumes. (London: R. H. Porter, 1907–1914.) Price 10*l.* 10*s.* net, 2 vols.

"IT is almost impossible to study systematically any species, no matter how common, without continually adding to our store of knowledge and noticing new facts; and such facts may lead to the solution of problems connected with the mystery of life and the greater mystery of development." This sentence of Mr. Howard's may seem trite enough; but it comes not amiss to British ornithologists, whose energies have been mainly occupied with the classification and distribution of species and with the discovery of new subspecies or local varieties rather than with biological questions. Mr. Howard's work, which has been coming out in parts since 1907, has certain decided advantages in comparison with its predecessors, though it deals only with a few species, and biologically only with about a dozen. First, it is the result of most persevering watching, mainly at that time of the day when birds are more full of life than at any other—the hours immediately following sunrise—and at the time of year when, from a biological point of view, they are best worth watching, *i.e.* the months from their arrival in this country to the end of the breeding season. It is true that we have to depend as yet largely on Mr. Howard's evidence alone. But that evidence is, to my ornithological feeling, not only to be trusted with confidence, but extremely stimulating; and as soon as the war is over we shall have numbers of good observers ready to spend their early hours in the woods as vigilantly as in the trenches.

Again, Mr. Howard has not been content with the collection of facts, but endeavours honestly and independently to interpret them, raising and discussing certain biological questions which they suggest. In fact, the work is a valuable study in biology. Imperfect it assuredly is, for the birds treated of from close personal experience are few, and Mr. Howard's experience has been growing during the seven years of publication; but these imperfections are of small moment compared with the stimulus given to inquiry, which has already begun to work among our field ornithologists. If the main results attained could be published in a small and comparatively cheap volume, well thought out, and perhaps more concisely and lucidly expressed than are the more scientific parts of these two big volumes, the benefits of the work would reach a much larger circle than is possible at present.

There is yet another advantage possessed by this book, viz., that it is illustrated by drawings of the most exquisite beauty and delicacy instead of by photographs. The most valuable of these, *i.e.* those which help us to "visualise" the author's observations, seem to be based on his own rough sketches made during observation, worked up to an artistic product with consummate skill and good faith by Mr. Grönvold. Mr. Howard is warmly to be congratulated on having the courage and the means to abandon the cumbrous camera for the mental impression and the pencil. When you are watching little creatures that creep about in dense cover, photography is really impracticable; and if you want to reproduce the attitude of such small birds for a third person you can do it much better if you are an artist than if you are a photographer, if only you have that tender feeling for the living bird which gives you intense delight in all its movements.

Mr. Howard's name will always be associated with what he calls the law of territory—a law which Mr. J. M. Dewar has recently been successfully applying in the *Zoologist* to the oyster-catchers of the Firth of Forth. We are all familiar with exemplifications of this law, and the only reason why it has not been promulgated before is that we have not been up early enough in the morning to realise its working fully. We know well enough that with the exception of the swallow tribe, which find their food in the air entirely, each pair of our summer migrants (and many, too, of our resident species) occupies a certain territory which serves as feeding-ground and playground. If a railway bank is patronised by whinchats, there will be a pair every hundred yards or so; along a roadside it is the same with yellowhammers; in a wood, in reeds, in osiers, with various species of warblers. In such positions as these three last the territories may differ from year to year according to the condition of the cover, but the rule holds good all the same.

Now Mr. Howard has gone far beyond this elementary statement of the law. His vigils have led him to the conviction that this territory is of immense importance in the life of our warblers; that the desire to secure it is what hurries on the males in front of the females during migration; that the vigorous singing on arrival is an announcement of occupation, and a defiance to other candidates for it; and that the bird's sense of boundary is unmistakable, though it may not exactly coincide with that which the observer imagines it to be. (See remarks on this point on p. 10 of the section on the willow warbler.)

There may well be some doubt as to whether

©1916 Nature Publishing Group

the male birds, in hurrying on, are in any way conscious of this particular end to be attained. Mr. Howard knows well that the sexual organs of these males are beginning to be enlarged before migration, *i.e.* the sexual impulse lies behind the whole operation. If the females of these species are weaker in vitality at the time of migration, this might be enough (as Darwin, I think, thought) to account for the earlier arrival of the males. More convincing is Mr. Howard's oft-repeated assertion that he has seen nothing in these territories to support the theory of sexual selection. What seems to happen is this: a male arrives and takes possession of a territory, and sings vigorously, awaiting a female. If another male intrudes, either before or after the appearance of the female, fights ensue and the intruder is driven out, but there is no indication that the female ever chooses between two males. The song and the strange antics (of which the book contains many beautiful drawings) are the result of sexual emotion, but are not the result of rivalry with another individual. The object is rather to overcome the coyness of the female—which reminds me of Mr. Crawley's theory of a similar phenomenon among primitive human beings, only to be overcome by a ceremony, *i.e.* marriage. This view of the bird's emotional antics leads Mr. Howard to another theory, viz., that the instinct known as "shamming wounded" is only an emotional display of the same kind. In this he was in part anticipated by Mr. W. H. Hudson, who, in his "Birds in a Village" (p. 64, *cp.* "Naturalist in La Plata," chap. xv.), explained the nearly related death-feigning instinct by actual paralysis of the nervous system. More careful observation, combined with physiological knowledge, is needed here. Yet another interesting problem is discussed in connection with the blackcap and marsh warbler, viz., the imitative faculty in song, where the mystery consists in the fact that birds of the year seem to be able to make these imitations without having ever heard the songs which they mimic.

I have perhaps said enough to give some idea of the importance of this contribution to our knowledge of the life of these warblers, and of the urgent need of the embodiment of some of its main conclusions in a cheaper form. I will conclude this notice by congratulating the author on having written the first complete account of the marsh warbler and its life during the breeding season. It is, perhaps, a pity that he should have cumbered this account by a preliminary twenty pages of somewhat obscure biological discussion, which might have formed an appendix or a chapter by itself; but when he is telling what he has himself seen of this charming species, nothing could be better. Only on one or two small points does my experience differ from his. He believes that this bird originally built in reeds like the reed warbler, on no other ground that I can discover but that the nest is sometimes hung in its supporting plants after the fashion of that closely allied species. I do not for a moment doubt his statement, but during my long experience of marsh warbler nests, both in England and abroad, I have never seen one that I could not recognise as such at once. One other point I would contest with him. I believe it to be quite impossible that this species should have been freely distributed in England and yet undiscovered up to the middle of the last century; surely the extraordinary brilliancy of the song is sufficient proof of this. The nest, too, is by no means hard to find, yet among old collections the only undoubted marsh warbler's egg I have ever seen is one found in Somerset some sixty-five years ago, which is now in the possession of the Rev. O. Pickard-Cambridge, of Bloxworth. I am strongly of opinion that the bird has long been, and still is, *slowly* increasing its range.

W WARDE FOWLER.

EDINBURGH MATHEMATICAL TRACTS.

(1) *A Course in Descriptive Geometry and Photogrammetry for the Mathematical Laboratory.* By E. L. Ince. Pp. viii + 79. (London: G. Bell and Sons, Ltd., 1915.) Price 2*s.* 6*d.* net.

(2) *A Course in Interpolation and Numerical Integration for the Mathematical Laboratory.* By D. Gibb. Pp. viii + 90. (London: G. Bell and Sons, Ltd., 1915.) Price 3*s.* 6*d.* net.

(3) *Relativity.* By Prof. A. Conway. Pp. 43. (London: G. Bell and Sons, Ltd., 1915.) Price 2*s.* net.

(4) *A Course in Fourier's Analysis and Periodogram Analysis for the Mathematical Laboratory.* By Dr. G. A. Carse and G. Shearer. Pp. viii + 66. (London: G. Bell and Sons, Ltd., 1915.) Price 3*s.* 6*d.* net.

(5) *A Course in the Solution of Spherical Triangles for the Mathematical Laboratory.* By H. Bell. Pp. viii + 66. (London: G. Bell and Sons, Ltd., 1915.) Price 2*s.* 6*d.* net.

(6) *An Introduction to the theory of Automorphic Functions.* By L. R. Ford. Pp. viii + 96. (London: G. Bell and Sons, Ltd., 1915.) Price 3*s.* 6*d.* net.

THE publication of this series may be taken to show that the experiment of issuing tracts on advanced mathematical subjects has been a success. The field is so wide that there is no serious risk of overlapping, especially if the

©1916 Nature Publishing Group